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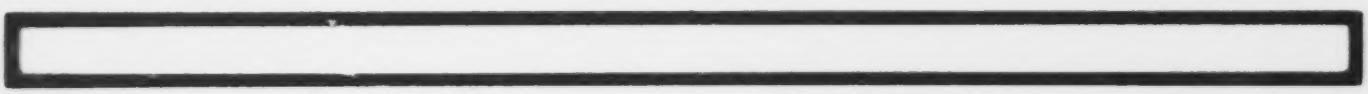

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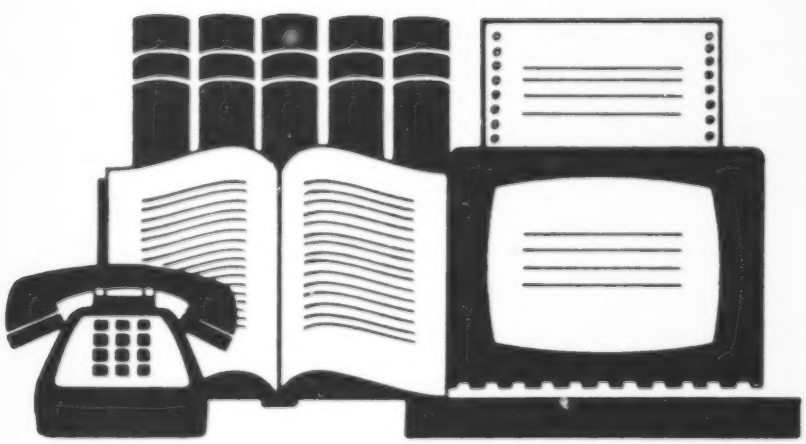

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References in the bibliography include books, reports, and non-technical magazine articles. Citations cover the period from January 1986 through March 1989. Where available, a descriptive abstract is included with the citation.

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INTRODUCTION

Marine debris is a worldwide environmental issue. Debris on beaches and in oceans may cause many problems, including ecological, wildlife, economic, recreational and aesthetic concerns. The proliferation of plastic packaging in recent years has aggravated the problem. Many marine animals are dying as a result of becoming entangled in debris or by ingesting it.

This bibliograpy is a joint effort by the library staffs at the U.S. Environmental Protection Agency Headquarters and the U.S. National Oceanic and Atmospheric Administration (NOAA). It provides a source for identifying introductory materials on the marine debris problem. Materials listed in the bibliography include books, reports, and non-technical magazine articles.

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[ASFA] **Aquatic Sciences and Fisheries Abstracts**
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5161 River Road
Bethesda, MD 20816

[BIP] **Books in Print**
R. R. Bowker
245 West 17th Street
New York, NY 10011

[ENV] **Enviroline**
Environment Information Center, Inc.
292 Madison Avenue
New York, NY 10017

[EB] **Environmental Bibliography**
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[GPO] **GPO Monthly Catalog/GPO Pubications Reference File**
Records Branch, STOP:SSMR
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20401

[LRI] **Legal Resources Index**
Information Access Company
11 Davis Drive
Belmont, CA 94002

[MI] **Magazine Index**
Information Access Company
11 Davis Drive
Belmont, CA 94002

[PA] **Pollution Abstracts**
Cambridge Scientific Abstracts
5161 River Road
Bethesda, MD 20816

I. GENERAL INFORMATION

A Citizen's Guide to Plastic in the Ocean: More Than a Litter Problem
O'Hara, Kathryn J.; Iudicello, Suzanne; Perry, Jill
Center for Environmental Education 1988 140p. [BIP]

▲ ▲ ▲

Controlling and Reducing Pollution from Plastic Waste, Sen Comm Env Public Works Hearings 100 Con 1 100-322, Jun 1, Sep 17, 87 (397)

Hearings were conducted to discuss three bills proposed for the control of plastic waste disposal. S. 559 would require EPA to assess measures available to reduce the adverse effects on the environment associated with dumping of plastics on land and in waters. Annex V to the Intl Convention for the Prevention of Pollution from Ships would be implemented under S. 560; the disposal of any plastic items or wastes into US territorial waters would be prohibited. S. 633 would also prohibit the disposal of plastic products into waters under US jurisdiction and would require a study to determine ways to eliminate plastic pollution. Testimony was delivered by Jane Hopkins of EPA; George McCann of the New Jersey Dept. of Env. Protection; and others. Associated documents and memoranda are appended. [ENV]

▲ ▲ ▲

Degradable Polymers?
Parr, Jan
Forbes, Oct 5, 87, v140, n7, p206(3)

Because it does not decompose, plastic debris discharged into oceans inevitably ends up on beaches. The best solution, which may be at hand, is to fabricate a plastic that actually rots. The key turns out to be cornstarch: when mixed with plastic wastes, the trash will disintegrate after perhaps five years. The long chains of glucose molecules that make up cornstarch become interspersed within polymers in the oil-based plastic. Once exposed to the elements, the cornstarch polymers become food for any fungi or bacteria in the surrounding environment. Large plastics manufacturers are resisting adopting this new technology, which will weaken the durability and strength of plastics products. They are concentrating instead on developing photodegradable plastic. (3 Photos) [ENV]

The Dirty Seas
Time, Aug 1, 88, v132, n5, p44(7)

The popular assumption that the oceans can heal themselves has been shaken by this summer's closed beaches. The pollution of the oceans and estuaries goes far beyond the dangers to swimmers from visible medical waste. Chronic land-based pollution includes agricultural runoff, waste water from sewage treatment and industry, and raw sewage from overflowing sewers. Garbage and plastics from boats and ships contribute to the problem, as does acid rain and wind-borne pesticides. The negative effects are seen in shellfish, dying dolphins along the atlantic coast, red tides, and seabirds and sea lions entangled or choked by plastic nets and rings. Although some communities are passing local laws and the us recently ratified an amendment to the MARPOL Treaty prohibiting the jettisoning of plastics in the oceans, cleanup has had a low political priority and states and municipalities are still not complying with the 1972 clean water act. (1 diagram, 1 map, 5 photos) [ENV]

▲ ▲ ▲

Don't go near the water; after decades of abuse, our costal waters are dying. Is it too late to save them?
Morganthau, Tom
Newsweek v112 p42(6) Aug 1, 1988 [MI]

▲ ▲ ▲

Floating megalitter in the Eastern Mediterranean
McCoy, F.W.
Marine Pollution Bulletin, Vol. 19, No. 1, pp. 25-28 1988

Concentrations of floating megalitter-floating debris that is large enough for sighting by eye or with binoculars-were measured from a ship in a small area (8.3 km super(2)) of the eastern Mediterranean Sea over a 22 day period. Suggested concentrations are on the order of 0.012 g m super(-2), based upon a limited data base, but are close to values determined elsewhere in the Mediterranean. If these values are representative of regional concentrations, then as many as 3.6 x 10 super(6) objects may be afloat per day as megalitter in the Mediterranean Sea. Most of the observed megalitter was plastic debris; all of the litter was man-made. [PA]

▲ ▲ ▲

Last summer at the Jersey shore. (includes related article on water composition)
Stutz, Bruce
Oceans v21 p8(9) Aug, 1988 [MI]

Leatherbacks: poachers, tourists, and plastic bags are new actors in an age-old play
Cherrington, Mark
Earthwatch, 1987 Vol. VI, No. 4 (July-August), p. 22 [EB]

▲ ▲ ▲

Man-made killer of the seas. (plastic pollution in the ocean)
Berliant, Adam
U.S. News & World Report v103 p72(1) July 6, 1987 [MI]

▲ ▲ ▲

Marine Litter: More Than an Eyesore
Aquanotes, Jun 87, v16, n2, p1(4)

Litter pollution of coastal areas in the U.S. has caused growing alarm. The routine dumping of plastics into the oceans poses a serious threat to marine wildlife causing death and serious injury. Public and Congressional concern has prompted legislative efforts for a comprehensive solution to marine plastics debris. Although government action is necessary, the actions of individuals such as merchant seamen, fishermen and recreational boaters and beach visitors are needed to reduce plastic marine debris. (4 photos) [ENV]

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Occurrence of tar and other pollution on the Saudi Arabian shores of the Gulf.
Price, A.R.G.; Wrathall, T.J.; Bernard, S.M.
Marine Pollution Bulletin, vol. 18, no. 12, pp. 650-651, 1987

A survey was undertaken during February-March 1986, when virtually the entire Saudi Arabian Gulf coastline was inspected between the northern (Saudi-Kuwait) border and southern (Saudi-Qatar) border. Data collected on the occurrence and magnitude of both beach tar and other forms of pollution are summarised graphically. Beach tar balls were encountered at 77% of the coastal sites visited, confirming earlier reports. The abundance value recorded most frequently (mode) was 3, denoting moderate amounts of tar at the majority of sites. Other forms of pollution were recorded at 87% of the coastal sites, and included such items as plastic containers, scrap metal, tire and other human refuse. [ASFA]

Our befouled beaches; condoms, styrofoam and germs litter the sea.
Adler, Jerry
Newsweek v110 p50(2) July 27, 1987 [MI]

Patterns in the abundance of pelagic plastic and tar in the North Pacific Ocean, 1976-1985

Day, R.H.; Shaw, D.G.
Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-23 April 1986. Wolfe, D.A. (ed.)
Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp.311-316

The authors have determined the distribution and abundance of pelagic plastic and tar in the subtropical and subarctic North Pacific and the Bering Sea in June-August 1985 and compared them with similar observations from the same areas in 1976 and 1984. Large (approximately equals 2.5 cm diameter or larger) plastic objects were counted from the deck of a ship, and small plastic objects and tarballs were caught with a neuston net. Densities (number items/m super(-2)) of large plastic in subtropical waters averaged two times those in subartic waters and eight times those in the Bering Sea. Concentrations (cm/m super(-2)) of small plastic in subropical waters averaged 26 times those in subarctic waters and 400 times those in the Bering Sea. Concentrations of tar in subropical waters averaged three times those in subarctic waters; no tar was found in the Bering Sea. Densities of large plastic along 155 degree W in the Subarctic North Pacific were not significantly different between 1984 and 1985. Concentrations of small plastic increased significantly between 1976 (along 158 degree W) and 1985 (along 155 degree W). [PA]

▲ ▲ ▲

Plastic clogs the oceans

Keyser, Joe
Not Man Apart, 1986 Vol. 16, No. 5 (September-October), p. 4 [EB]

▲ ▲ ▲

Plastic debris problem growing. (in the nation's waters)

Oceans v19 p66(2) May-June, 1986 [MI]

▲ ▲ ▲

Plastic in the North Atlantic

Wilber, R. Jude
Oceanus, 1987 Vol. 30, No. 3 (Fall), p. 61 [EB]

Plastic in the Ocean: What Are We Doing to Clean It Up
Augerot, X.
National Oceanic and Atmospheric Administration, Rockville, MD. Office of Sea Grant and Extramural Programs.
Report No.: WSG-AS-88-6
Jul 88 10p
NTIS order no.: PB88-244348/XAB

Plastic trash in the ocean is a hazard to wildlife and human safety. Six-pack rings, fishing line and plastic bags can trap, choke and strangle fish, birds and marine mammals. Larger pieces of plastic such as scraps of fishing net and rope foul propellers and cooling water intakes, causing a navigation and safety hazard for boaters and fishermen. Last year, Congress passed the Marine Plastic Pollution Research and Control Act (MPPRCA), which bans disposal of plastic trash in the ocean. The Washington Sea Grant marine advisory publication details the components of the new law and its potential effects on the boater, port manager and fisherman. [NTIS]

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Plastic ocean pollution: "stow it"
Sea Technology, 1987 Vol. 28, No. 10 (October), p. 81 [EB]

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Plastic: Progress and Peril
Schneidman, Diane
Marketing News v21n26 pp: 1,6-8 Dec 18, 1987

Plastic is a shatterproof, versatile, lightweight, and cost-effective packaging material, but it is becoming a nightmare for ocean life and may be causing problems for land animals and humans as well. Many ocean animals mistake pieces of plastic for food, the items lodge in their throats, and they suffocate. Seals frequently become entangled in plastic sixpack container holders. Overall, plastic pollution poses a greater threat to marine birds and mammals than spilled oil, pesticides, or contaminated runoff. Certain forms of plastic-based foam packaging, such as that used by McDonald's Corp., threaten life on earth because they are harmful to the earth's ozone layer. Plastic packaging and the resultant waste continue to grow nearly unchecked. In response to the ecological problems, there have been bills introduced in Congress, some states have passed laws regarding 6-pack plastic containers, and private corporations have begun offering alternative, degradable products. Recycling of plastic waste also is being studied. Charts. Graphs. [ABI]

Plastic pellets and tar on Spain's Mediterranean beaches
Shiber, J.G.
Marine Pollution Bulletin, Vol. 18, No. 2, pp. 84-86, 1987

Eighteen beaches on the Mediterranean coast of Spain, from Barcelona to Algeciras, were surveyed for the presence of plastic pellets. Spherules in great variety of shape and colour, often covered with tar, were found to be abundant on most beaches, particularly at Sitges, Calafell, and Salou on the Costa Dorada and Gandia on the Costa del Azahar. Tar lumps were also very common. Over 100 of Spain's approximately 190 plastics manufacturers are situated on or near the Mediterranean coast. Wastes from these factories and spillage during cargo loading and sea transport of raw materials are thought to be the most likely major sources of the pellets. [PA]

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Plastics adrift
Bulloch, David K.
Underwater Naturalist, 1987 Vol. 16, No. 4, p. 24 [EB]

▲ ▲ ▲

Plastics in the sea. Selected papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 April, 1986.
Wolfe, D.A. (ed.)
Marine Pollution Bulletin, Vol. 18, No. 6B, 1987 (spec. issue)

Twelve relevant papers are cited from this conference. Areas of discussion include the peristence and abundance of plastics debris and pelagic tar in the marine envirnment and the effects of plastic debris on the marine organisms. [PA]

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Preliminary studies of man-made litter in the Firth of Forth, Scotland
Caulton, E.; Mocogni, M.
Marine Pollution Bulletin, Vol. 18, No. 8, pp. 446-450, 1987

Short-term studies on man-made litter deposited on the beaches of the Edinburgh coastline of the Firth of Forth, Scotland, have demonstrated that containers of all kinds, plastic bags, plastic sheeting and clothing, comprise the main and dominant components of the nineteen categories of litter analysed. Most of the litter is of local origin either deposited in situ or washed ashore from neighbouring water's-edge tips. Very little evidence was found of litter washed ashore being of foreign origin or having been tipped overboard from ships at sea. Much of the smaller items of litter are discarded by visitors to the beach. [PA]

Rating water quality at the beaches. (New Jersey)
Mallowe, Mike
Philadelphia Magazine v78 p144(6) Aug, 1987 [MI]

▲ ▲ ▲

Sources, quantities and distribution of persistent plastics in the marine environment
Pruter, A.T.
Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 April 1986. Wolfe, D.A. (ed.)
Marine Pollution Bulletin, Vol. 18, No. 6B, 1987 pp. 305-310

Persistent plastics are widely distributed at the surface and coastal margins of the global oceans, but many uncertainties remain about their specific sources, quantities and distribution. Awareness of the problem of plastic pollution has grown only recently. Thus, systematic observations have not been either extensive enough or long enough to document the situation adequately. Major sources of these materials are from land, vessels and beachgoers. This paper reviews recent literature on the sources, amounts and distribution of various types of plastics in the marine environment. [PA]

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Threatened oceans; a plague of plastic is poisoning our sea.
Rybovich, John
Boating v61 p25(3) Nov, 1988 [MI]

▲ ▲ ▲

Warnings from the seas. (waste washing up on beaches)
Finlayson, Ann
Maclean's v101 p48(2) Sept 5, 1988 [MI]

▲ ▲ ▲

Wretched refuse off our shores. (ocean dumping)
Milleman, Beth
Sierra v74 p26(3) Jan-Feb, 1989 [MI]

II. SOURCES OF DEBRIS

A. Land-Based Debris

Beachless summer. (trash from ocean dumping)
Reynolds, Clarence V.
Discover v10 p38(1) Jan, 1989 [MI]

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Blood in water: a tide of hospital waste. (vials of blood & B47 syringes found on New York's Long Island beachfront)
Baker, James N.
Newsweek v112 p35(1) July 18, 1988 [MI]

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Garbage out, garbage in. (polluted beaches in New Jersey and New York)
U.S. News & World Report v105 p9(1) July 18, 1988 [MI]

▲ ▲ ▲

Hospital Waste: You Can Run, You Can't Hide
Aschkenasy, Janet
National Underwriter (Property/Casualty/Employee Benefits)
v92n39 pp.: 105-106 Sep 26, 1988

Insurance buyers for hospitals and municipalities seem oblivious to a potential crisis concerning the repeated sightings of hospital waste along the Northeast US coast this summer. Brokerage houses appear to be unaware of the enormous opportunity on the consulting side. Brokers, who are supposed to be risk experts, could generate awareness among risk managers and urge them to identify and minimize their potential liabilities and to recognize potential penalties as lawmakers respond to growing public concern over ocean contamination. Few brokerages have anticipated an increased demand for environmental impairment liability coverage or for coaching preventive hospital waste disposal techniques. However, their efforts have met with indifference. Hospitals cannot remain idle about the issue of waste disposal, and they need to be proactive in their management of waste. Hospitals could benefit from a product that would cover their contingent liabilities for pollution caused by waste haulers, but that kind of insurance seems to be nonexistent. [ABI]

Medical waste just one threat to beaches.
National Parks v63 p9(2) Jan-Feb, 1989 [MI]

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Needle Scare Provokes Push for Federal Law Governing Disposal of Medical Waste
Tokarski, Cathy
Modern Healthcare v18n30 PP: 32 Jul 22, 1988

Medical waste disposal, like the acquired immune deficiency syndrome (AIDS)-contaminated needles that washed up on East Coast US beaches in 1988, has led to a demand for federal oversight. While some experts believe that more uniform practices would be ensured by a federal law, the Environmental Protection Agency (EPA) states that present accrediting agencies and state laws are effectively monitoring infectious waste disposal. Denise Zabinski of the EPA further stated that negligent practices seem to be isolated. In July 1988, Frank Lautenberg was among 4 senators to introduce a bill requiring the EPA to set up a program for tracking practices in New York and New Jersey. However, the lack of consensus concerning hospital waste disposal is reflected in state laws, which vary. Environmental standards also are changing, making it difficult for hospitals to comply. For example, a hospital incinerator in Madison, Wisconsin, has been given a temporary permit while new regulations are being developed. It appears that federal laws would be more predictable than state laws. [ABI]

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Opportunity knocks. (profit made from infectious waste washing up on East Coast)
Crudele, John
New York v21 p39(1) Sept 12, 1988 [MI]

▲ ▲ ▲

Sally sells syringes by the seashore. (medical waste on the east coast)
Ciesla, Frank R.; Robins, Andrew B.
New Jersey Law Journal v122 n12 col 1 p7 Sept 22, 1988 [LRI]

▲ ▲ ▲

Screening sewage protects beaches.
Besselievre, Edmund B.
American City & County v103 p46(1) Oct, 1988 [MI]

Why a flood of filth laps the beaches.
U.S. News & World Report v105 p7(2) Aug 22, 1988 [MI]

B. Debris From Marine Vessels

Litter pollution from ships in the German Bight
Vauk, G.J.M.; Schrey, E.
Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 Apr 1986. Wolfe, D.A. (ed.)
Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp. 316-319

A 60-m length of beach at Helgoland was sampled approximately every third day for a year to determine the composition of litter deposited there. A total of 8,473 items with a total weight of 1,320 kg were identified as shipping wastes in the 106 samples. Plastics of all types composed 75% of the items, whereas wood represented 65% of the total weight. Ships' waste from along the main shipping routes in the southern German Bight many be a dominant source of the litter. The objects found were originally manufactured in 26 different nations. The study provides an estimation of the dimensions of litter pollution in the area of the inner German Bight. [PA]

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Persistent plastics and debris in the ocean: An international problem of ocean disposal
Wolfe, D.A.
Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 April 1986. Wolfe, D.A. (ed.)
Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp. 303-305

The Sixth International Ocean Disposal Symposium (IODS6), brought together about 160 participants from 10 nations to discuss various aspects of waste disposal and its effects in the oceans. The objective of the symposium series is to provide a forum for the exchange of ideas and information among investigators involved in oceanic disposal research, to enhance the scientific considerations of waste disposal in the marine environment, and to generate recommendations and guidelines for future studies on oceanic disposal practices. A major theme at IODS6 was the at-sea disposal of plastics and other persistent synthetic materials (including fishing nets). Papers have been selected from those presented at the meeting to provide a comprehensive overview of problems related to persistent plastics and debris in the sea,

and a representative selection of current research topics in this field. [PA]

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Plastic Pollution in the Marine Environment: Boaters Can Help Control a Growing Problem

Farrell, J. G.
Geological Survey, Reston, VA. Water Resources Division
Jul 1988 4p.
NTIS order no.: PB88-229075

Plastic pollution is a growing problem in the oceans; a problem with dire consequences. A six-pack ring can become a deadly noose for a bird or fish. A plastic bag looks like a tasty jellyfish to an indiscriminate feeder like the sea turtle, but plastic is indigestible. It can choke, block the intestines, or cause infection in those animals that consume it. A plastic bag also can clog an outboard engine's cooling system. Lost or discarded monofilament fishing line can foul propellers, destroying oil seals and lower units on engines, or it can become an entangling web for fish, sea birds, and marine mammals. The publication provides helpful tips for boaters interested in preventing the improper disposal of plastic into the marine environment. [NTIS]

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Reducing Navy Marine Plastic Pollution

Keystone Center, CO.
28 Jun 88 54p
NTIS order no: AD-A201 794/5

Over the last two decades, the United States and other nations have become increasingly aware of the impacts of human activity on the marine environment. In recent years, no environmental issue involving the oceans has engendered as much public attention and concern as marine plastics pollution. Plastic debris from ships is littering beaches, and killing and debilitating fish and wildlife because they are ingesting plastic, or because they are becoming entangled in plastic debris. While no one is purposefully causing these impacts, the effects are becoming more pronounced. In the United States and throughout much of the world, the use of plastics has grown exponentially. Plastic products are often more economical than non-plastic substitutes and present many attractive characteristics. Plastics enhance the shelf life and storage of products, provide ease in handling and use of plastic products for food storage and packaging, and as a component of many everyday products, has increased significantly, The result is readily apparent in the increase in plastic use at home, in commercial use, and on board commercial and military ships. [NTIS]

The tightening net of marine plastics pollution.
Conner, Daniel Keith; O'Dell, Robert
Environment v30 p16(9) Jan-Feb, 1988 [MI]

▲ ▲ ▲

The Trashy Sea Around Us
Mackenzie William H.
Defenders, May-Jun 87, v62, n3, p30(8)

Plastic debris in the world's oceans poses hazards to marine mammals, fish, and birds. The world's merchant fleets alone dump an estimated 450,000 plastic containers into the sea daily; recreational boaters add their share. The qualities that made plastic attractive to manufacturers and consumers, particularly its durability, have made it a menace at sea. Seabirds and marine mammals readily become entangled in debris, such as abandoned fishing nets; whales, turtles, and other animals ingest the plastic and slowly die. At the international level, efforts are underway to gain U.S. ratification of Annex V to the 1973 Marine Pollution Convention, which would ban at-sea dumping of all persistent plastics and synthetics. Volunteer efforts are growing at the state level, as witnessed by the spread of Oregon's citizen beach cleanup. (8 Photos) [ENV]

III. EFFECTS ON WILDLIFE AND HUMANS

dup. (gen. info)

Caught in a plastic trap
Bowker, Michael
International Wildlife, 1986 V.16, N.3 (May-June), p.22 [EB]

▲ ▲ ▲

Death by plastic, or what the tide brought in.
Spurr, Dan
Cruising World v14 p20(2) Sept, 1988 [MI]

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Effects of ingested plastic on seabird feeding: Evidence from chickens
Ryan, P.G.
Marine Pollution Bulletin, Vol. 19, No. 3, pp. 125-128, 1988

Domestic chickens (Gallus domesticus) were fed polyethylene pellets to test whether ingested plastic impairs feeding activity. When food was temporally limited, plastic-loaded birds ate less than control birds, apparently as a result of reduced gizzard volume. When given food ad libitum, plastic-loaded birds also ate less and grew slower than did control birds. It is concluded that ingested plastic reduces meal size and thus food consumption when plastic reduces the storage volume of the stomach. This reduced food consumption may limit the ability of seabirds with large plastic loads to lay down fat deposits, and thus reduce fitness. [PA]

▲ ▲ ▲

Entanglement of pinnipeds in synthetic debris and fishing net and line fragments at San Nicolas and San Miguel islands, California, 1978-1986
Stewart, B.S.; Yochem, P.K.
Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 April 1986. Wolfe, D.A. (ed.)
Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp.336-339

Trends in abundance of pinnipeds in Southern California have apparently not been significantly influenced by entanglement of individuals in marine debris. Juveniles may be the most susceptible to entanglement in debris and the effect of any recent declines in survival of younger age classes on trends in annual numbers of births may not be detectable for several years. Further studies are needed to document trends in debris-related entanglement and the effects of this entanglement on juvenile survival and subsequent recruitment. [PA]

Impact of nondegradable marine debris on the ecology and survival outlook of sea turtles

Carr, A.

Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 April 1986. Wolfe, D.A. (ed.)

Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp.352-356

Sea turtles of all kinds are peculiarly prone to eat plastic scraps and other buoyant debris and to tangle themselves in lines and netting discarded by fishermen, and records of such mishaps have increased markedly in recent years. Advances in our understanding of the developmental ecology of sea turtles shed new light on the impact of buoyant wastes on the juvenile stages. The initial developmental stages of all species are passed in the open sea. In the case of the loggerhead Caretta this period of pelagic life is likely to include 3-5 years of planktonic open-ocean travel, which may involve multiple transatlantic crossings. During this time both the young turtles and their buoyant food are drawn by advection into fronts (convergences, rips, driftlines) and the same process also brings in and aligns persistent plastics and lost fishing gear. [PA]

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Ingestion of plastic debris by Laysan albatrosses and wedge-tailed shearwaters in the Hawaiian Islands

Fry, D.M.; Fefer, S.I.; Sileofe, L.

Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 April 1986. Wolfe, D.A. (ed.)

Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp.339-343

Surveys of Laysan albatross (Diomedea immutabilis) and wedge-tailed shearwaters (Puffinus pacificus) on Midway and Oahu Island, Hawaii, identified a high proportion of birds with plastic in the upper gastrointestinal tract. Fifty Laysan albatross chicks were examined for plastic items lodged within the upper digestive tract. Forty-five (90%) contained plastic, including 3 chicks having proventricular impactions or ulcerative lesions. Plastic items in 21 live albatross chicks weighed a mean of 35.7 g/ chick super(-1) (range 1-175 g). Two of four adult albatross examined contained plastic in the gut. Twelve =of 20 adult Wedge-tailed Shearwaters (60%) contained plastic particles 2-4 mm in diameter. Chemical toxicity of plastic polymers, plasticizers and antioxidant additives is low, although many pigments are toxic and plastics may serve as vehicles for the adsorption of organochlorine pollutants from sea water, and the toxicity of plastics is unlikely to pose a significant hazard. [PA]

Involvement of loggerhead turtle with the plastic, metal, and hydrocarbon pollution in the Central Mediterranean
Gramentz, D.
Marine Pollution Bulletin, Vol. 19, No. 1, pp. 11-13, 1988

Over 20% of loggerhead turtles (Caretta caretta) examined at Malta were contaminated with plastic or metal litter and hydrocarbons. The nature of the contamination suggests that the number of sea turtles suffering from pollution is certainly higher. [PA]

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The lifespan of ingested plastic particles in seabirds and their effect on digestive efficiency
Ryan, P.G.; Jackson, S.
Marine Pollution Bulletin, Vol. 18, No. 5, pp. 217-219, 1987

The assimilation efficiencies of fledgling Whitechinned Petrels Procellaria aequinoctialis artifically fed large quantities of plastic particles were assessed. No significant differences were detected in either assimilation efficiency or the rate of mass loss between experimental and control birds. Polyethylene pellets lost 1% of their mass after 12 days in the experimental birds' stomachs, suggesting a half-life of at least one year. No instances of plastic causing intestinal obstruction, and few cases of physical damage to te stomach lining, were found in over 400 individuals of 25 species of seabirds containing ingested plastic. These results suggest ingested plastic seldom impairs digestive efficiency in seabirds. [PA]

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Marine birds and plastic pollution.
Azzarello, M.Y.; Van Vleet, E.S.
Marine Ecology (Progress Series), vol. 37, no. 2-3, pp. 295-303, (1987)

The intrinsic properties and widespread presence of plastic particles in the marine environment have profound effects on birds inhabiting the world's oceans. The dispersal and accumulation of plastics, in average densities of 1,000 to 4,000 pieces/km super(2), are controlled by surface currents, wind patterns, and different geographic inputs. Seabirds in the order Procellariiformes are most vulnerable to the effects of plastic ingestion due to their smaller gizzard and their inability to regurgitate ingested plastics. Planktivores have a higher incidence of ingested plastics than do piscivores as the former are more likely to confuse plastic pellets with copepods, euphausiids, and cephalopods. Hence, diet may be a major factor determining the quantity of plastic ingested. Physiological

effects related to the ingestion of plastics include obstruction of the gastrointestines and of subsequent passage of food into the intestines, blockage of gastric enzyme secretion, diminished feeding stimulus, lowered steroid hormone levels, delayed ovulation and reproductive failure. [ASFA]

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Marine debris and northern fur seals: A case study

Fowler, C.W.

Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 April 1986. Wolfe, D.A. (ed.)

Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp. 326-335

Since the early 1930s small numbers of northern fur seals (Callorhinus ursinus) have been observed with various objects caught around their necks, shoulders and less frequently, their flippers. The incidence of such entanglement increased following the mid-1960s when fishing effort in the North Pacific and Bering Sea increased and when plastic materials began to be used extensively in making trawl netting and packing bands. The current incidence of entanglement observed among subadult males on St. Paul Island (of the Pribilof Islands) is approximately equals 0.4%, a level at least two orders of magnitude greater than observed in the 1940s. Mortality of fur seals due to entanglement in marine debris contributes significantly to declining trends of the population on the Pribilof Islands. [PA]

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Overview of the biological effects of lost and discarded plastic debris in the marine environment

Laist, D.W.

Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-24 April 1986. Wolfe, D.A. (ed.)

Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp. 319-326

In the past 30 years, the use of plastics and other synthetic materials has expanded at a rapid pace. The accumulating debris poses increasingly significant threats to marine mammals, seabirds, turtles, fish, and crustaceans. The threats are straightforward and primarily mechanical. Individual animals may become entangled in loops or openings of floating or submerged debris or they may ingest plastic materials. Animals that become entangled may drown, have their ability to catch food or avoid predators impaired, or incur wounds from abrasive or cutting action of attached debris. Ingested plastics may block digestive tracts, damage stomach linings, or lessen feeding drives. Developing information suggests that the mechanical effects of these materials affect many marine species in many ocean areas,

IV. GOVERNMENT LEGISLATION AND REGULATIONS

A. International

Acceptance of remaining MARPOL annexes is approaching.
Anon.
Motor Ship, vol. 68, no. 810, p. 35, (1988).

The introduction of international controls on the discharge into the sea from ships of garbage and harmful substances in packaged forms is getting closer. The measures are contained in annexes to the International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78). This Convention, which was adopted under the auspices of the International Maritime Organisation, entered into force in 1983, when the annexes dealing with pollution by oil and chemicals in bulk became mandatory. The implementation of Annex II became effective from April 6, 1987. [ASFA]

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Control of marine pollution in international law. (book review)
Woloniecki, J.W.
International and Comparative Law Quarterly 35 n4 1009-1010 Oct, 1986 [LRI]

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The ghosts of fishing nets past: a proposal for regulating derelict synthetic fishing nets.
Ejelstad, Eric J.
Washington Law Review 63 n3 677-699 July, 1988 [LRI]

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International law development on marine pollution from land-based sources. (book review)
McGill Law Journal 32 n4 952-953 Sept, 1987 [LRI]

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Land-Based Marine Pollution: International Law Development. (book review)
Kwiatkowska, Barbara
International Journal of Estuarine and Coastal Law 3 n3 277-280 Aug, 1988 [LRI]

Legal strategies for reducing persistent plastics in the marine environment.
Bean, M.J.
Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 April, 1986. Wolfe, D.A. (ed.)
Marine Pollution Bulletin, vol. 18, no. 6B, 1987, pp. 357-360

A variety of legal strategies could be employed to address aspects of the problem of persistent plastics in the marine environment. These include strategies based on international agreements, federal legislation, and state law. At the international level, plastic pollution from vessels is addressed by the International Convention Relating to Pollution from Ships (MARPOL), though its operative provisions are not yet in force. Various state measures focus primarily on reducing or preventing the problem of generation of plastic pollution from land-based sources. These include several laws that impose degradability standards for certain plastic products or attempt to encourage recycling of plastic waste. [ASFA]

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Marine Pollution and the Law of the Sea, 4 vols. (book review)
Joyner, Christopher C.
Vanderbilt Journal of Transnational Law 21 n4 843-854 Oct, 1988 [LRI]

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MARPOL Convention, Annex V : report (to accompany Treaty Doc. 100-3)
United States. Congress. Senate. Committee on Foreign Relations. Executive Report 100-8.
Washington, D.C. : U.S. G.P.O., 1987 58p.
GPO Item No.: 1008-C, 1008-D (microfiche) [GPO]

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Plastic Reaps a Grim Harvest in the Oceans of the World
Weisskopf Michael
Smithsonian, Mar 88, v18, n12, p.58(10)

Of millions of tons of garbage dumped in the oceans every year, plastics are considered by some scientists to be the most dangerous to marine species. The problem is worldwide. Seals and whales entangled in plastic netting can't feed or swim normally and starve, drown, or die of infection from wounds. Birds die from the impairment caused by six-pack rings around their necks. Other plastic rings and gaskets kill by constricting fish. Plastics eaten by sea turtles, baby whales, and sea birds cause

infection, intestinal blockage, and death. At the end of 1987, the U.S. Finally ratified Annex V of the 1973 Intl Convention for the Prevention of Pollution from Ships. But enforcement will be difficult because U.S. military vessels are exempt for five more years, and Annex V does not apply to waste from sewage treatment plants or plastics factories. Compacting, recycling, and degradable plastics are some other promising approaches to the problem. (15 photos) [ENV]

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Plastics in the marine environment: Legal approaches for international action

Lentz, S.A.
Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, 21-25 April 1986. Wolfe, D.A. (ed.)
Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp.361-365

Serious problems caused by the presence of plastic and other synthetic materials in the marine environment are well demonstrated. Legal regimes exist to address those problems internationally and regionally through the Law of the Sea Convention, The London Dumping Convention, an international agreement on vessel-source pollution, and regional conventions. This paper describes and compares those legal regimes. All provide appropriate forums for implementing specific mitigation measures and all should be fully utilized to regulate plastic pollution of the ocean. [PA]

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Regulations for the prevention of pollution by garbage from ships (Annex V of MARPOL 73/78): message from the President of the United States transmitting Annex V, Regulations for the prevention of pollution by garbage from ships, an optional annex to the 1978 protocol relating to the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73/78)

United States. Congress. Senate. Committee on Foreign Relations.
Washington: U.S. G.P.O., 1987. 4p.
GPO Item No.: 996-A, 996-B (microfiche) [GPO]

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The ship pollution problem.

Oceans v19 p62(1) Jan-Feb, 1986 [MI]

Transboundary pollution from Mexico: is judicial relief provided by international principles of tort law?
Sullivan, Margaret M.
Houston Journal of International Law 10 n1 105-131 Aut, 1987 [LRI]

B. Federal

Congress tackles ocean plastic pollution.
Blockstein, David E.
BioScience v38 p19(1) Jan, 1988 [MI]

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Degradable six-pack ring carriers : report (to accompany H.R. 5117 which...was referred jointly to the committees on Energy and Commerce and Merchant Marine and Fisheries) (including cost estimate of the Congressional Budget Office)
United States. Congress. House. Committee on Merchant Marine and Fisheries.
Washington, D.C. : U.S. G.P.O., 1988 [GPO]

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Marine Plastic Pollution Prevention Act of 1987
Senate Comm Commerce Science Transport 100 Con 1 Report 266, Dec 19, 87 (16)

H.R. 940, a bill to implement the provisions of Annex V to the Intl Convention for the Prevention of Pollution from Ships, has been approved for passage. The legislation provides a strategy for combatting the disposal and accumulation of plastic wastes from ships in marine waters. Annex V prohibits the discharge by vessels of plastic garbage anywhere in the ocean. They also restrict disposal at sea of other types of garbage at specified distances from the nearest land and mandate that ports and terminals have reception facilities capable of holding wastes from ships. The major provisions of the bill are outlined. [ENV]

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Medical Waste Sanctions Act of 1988 : report (to accompany H.R. 5231) (including cost estimate of the Congressional Budget Office)
United States. Congress. House. Committee on Merchant Marine and Fisheries.
Washington, D.C. : U.S. G.P.O., 1988. 15p. [GPO]

Ocean Dumping Ban Act : conference report (to accompany S. 2030)
United States. Congress.
Washington, D.C. : U.S. G.P.O., 1988. 47 p.
GPO Item No.: 1008-C, 1008-D (microfiche) [GPO]

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Ocean Dumping Reform Act of 1988 : report (to accompany S. 2030) together with additional views
United States. Congress. Senate. Committee on Environment and Public Works.
Washington, D.C. : U.S. G.P.O., 1988. 17 p.
GPO Item No.: 1008-C, 1008-D (microfiche) [GPO]

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Plastic Pollution Control Act of 1987 : report (to accompany S. 1986)
United States. Congress. Senate. Committee on Environment and Public Works.
Washington, D.C. : U.S. G.P.O., 1987. 16 p.
GPO Item No.: 1008-C, 1008-D (microfiche) [GPO]

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Plastic Pollution Research and Control Act : report (to accompany H.R. 940) (including cost estimate of the Congressional Budget Office)
United States. Congress. House. Committee on Merchant Marine and Fisheries.
Washington, D.C. : U.S. G.P.O., 1987.
GPO Item No.: 1008-C, 1008-D (microfiche) [GPO]

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Shore Protection Act of 1988 : report (to accompany S. 1751)
United States. Congress. Senate. Committee on Environment and Public Works.
Washington, D.C. : U.S. G.P.O., 1988. 8p.
GPO Item No.: 1008-C, 1008-D (microfiche) [GPO]

C. State

Legal strategies for reducing persistent plastics in the marine environment
Bean, M.J.
Plastics in the Sea. Selected Papers from the Sixth International Ocean Disposal Symposium, Pacific Grove, CA, 21-25 April 1986. Wolfe, D.A. (ed.)
Marine Pollution Bulletin, Vol. 18, No. 6B, 1987, pp. 357-360

A variety of legal strategies could be employed to address aspects of the problem of persistent plastics in the marine environment. These include strategies based on international agreements, federal legislation, and state law. At the international level, plastic pollution from vessels is addressed by the International Convention Relating to Pollution from Ships (MARPOL), though its operative provisions are not yet in force. Various state measures focus primarily on reducing or preventing the problem of generation of plastic pollution from land-based sources. These include several laws that impose degradability standards for certain plastic products or attempt to encourage recycling of plastic waste. [PA]

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Environmental litigation. (Product Liability) (New York)
Julien, Alfred S.
New York Law Journal v200 n81 col 1 p3 Oct 26, 1988 [LRI]

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Ocean protection legislation enacted. (New Jersey)
Goldshore, Lewis; Wolf, Marsha
New Jersey Law Journal v122 n5 col 1 p7 Aug 4, 1988 [LRI]

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States Seek Tighter Rules on Infectious Waste
Holthaus, David
Hospitals v62n17 pp. 70 Sep 5, 1988

When infectious medical waste washed ashore on beaches in several eastern seaboard states, regulators and legislators were able to boost campaigns to tighten rules governing the disposal of such waste. Prior to the incidents, several states were already considering the implementation of strict regulations, which promised to be costly to the hospital industry. Also, the Environmental Protection Agency currently is examining state regulations. If they are found to be inadequate, federal regulations could result. Proposed regulations in Wisconsin call

for incineration of infectious waste using state-of-the-art technology. New York is developing regulations that would require a strict manifest system and the labeling of waste to identify the hospital from which it came. A 1987 New York law calls for high-temperature incineration or steam sterilization of infectious wastes, color-coding of infectious materials, and use of licensed infectious waste haulers. [ABI]

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A Strategy for Public Participation in the Management of New York-New Jersey Harbor
EPA Report, May 88 (79). Envirofiche no. 89-00819.

An EPA-sponsored workshop was designed to promote an understanding of the roles and positions of New York, New Jersey, and EPA in managing the New York-New Jersey harbor as part of the EPA estuary management program. State and local representatives, as well as members of the public and scientific institutions were asked to identify and rank priority environmental problems in the harbor. Most felt that since floating debris was a manageable, short-term problem, it should be considered early in the program. Toxic contamination and pathogen pollution were ranked as high priority problems. Recommendations were also made concerning agency coordination, scientific and technical support, and public participation. (3 maps) [ENV]